

Biochar for carbon sequestration, developments in the carbon market

“How could carbon pricing add value to biochar projects: short and longer term perspectives”

European Union  The European Regional Development Fund

**The Interreg IVB
North Sea Region
Programme**



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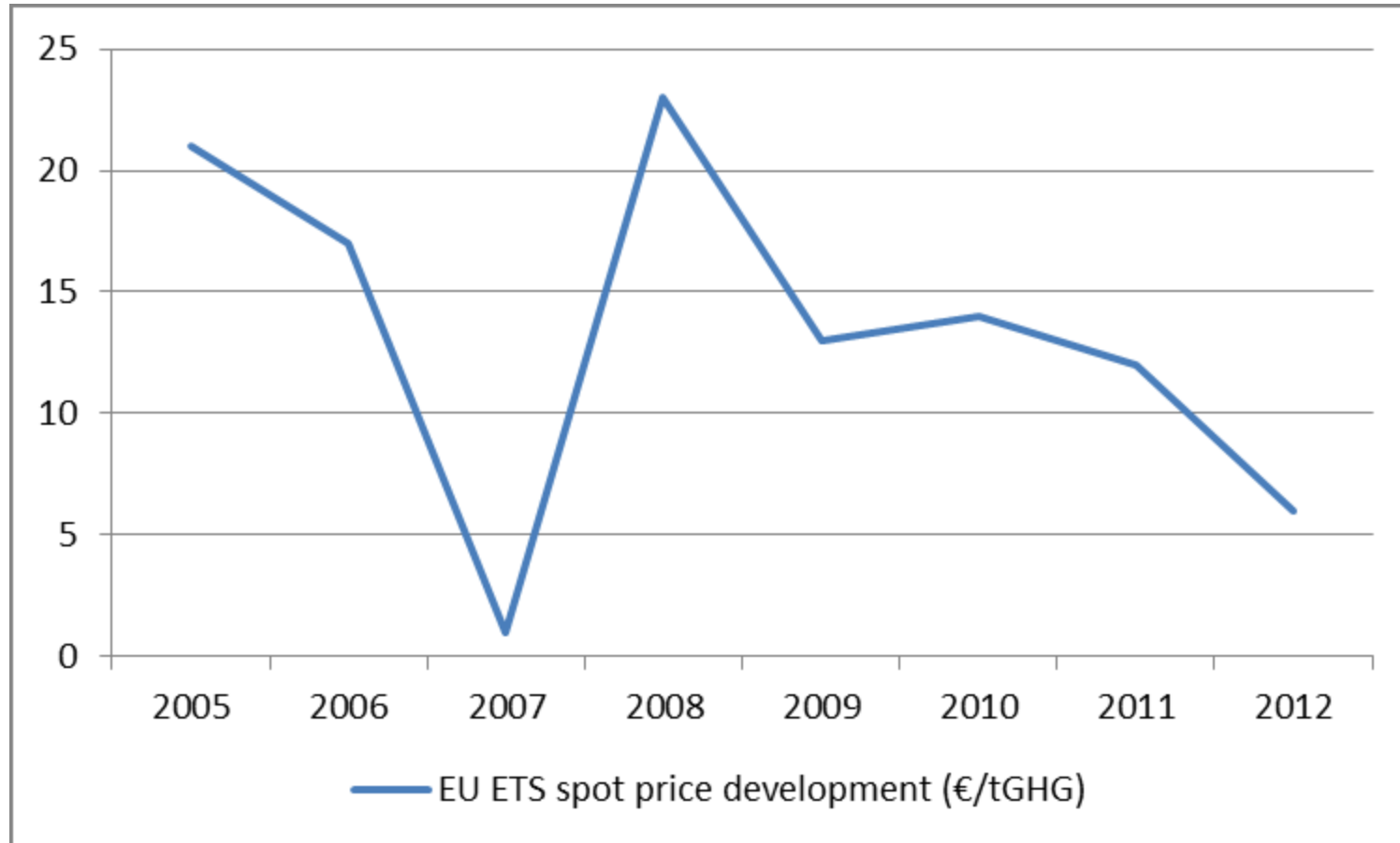
Current status of carbon markets

- UNFCCC & Kyoto Protocol (2008-2012 and > 2012)
 - Clean Development Mechanism & Joint Implementation
 - ± 8000 projects
- EU Emissions Trading Scheme
 - ± 12,000 installations
- Other compliance markets
 - RGGI - USA
 - WCI – Canada-USA
 - New Zealand ETS
 - CO₂-tax in Australia (reform bill into ETS system)
- Voluntary markets
 - JetBlue, eBay, Google, Dell, KLM, Siemens, conferences, etc.

Carbon prices have strongly decreased

- Reduced demand
 - Kyoto Protocol: USA, Canada
 - Economic crisis
- Overallocation
 - Russia
 - EU ETS
- Some (voluntary) markets have remained relatively stable
 - Not directly linked to 'Kyoto' and EU ETS

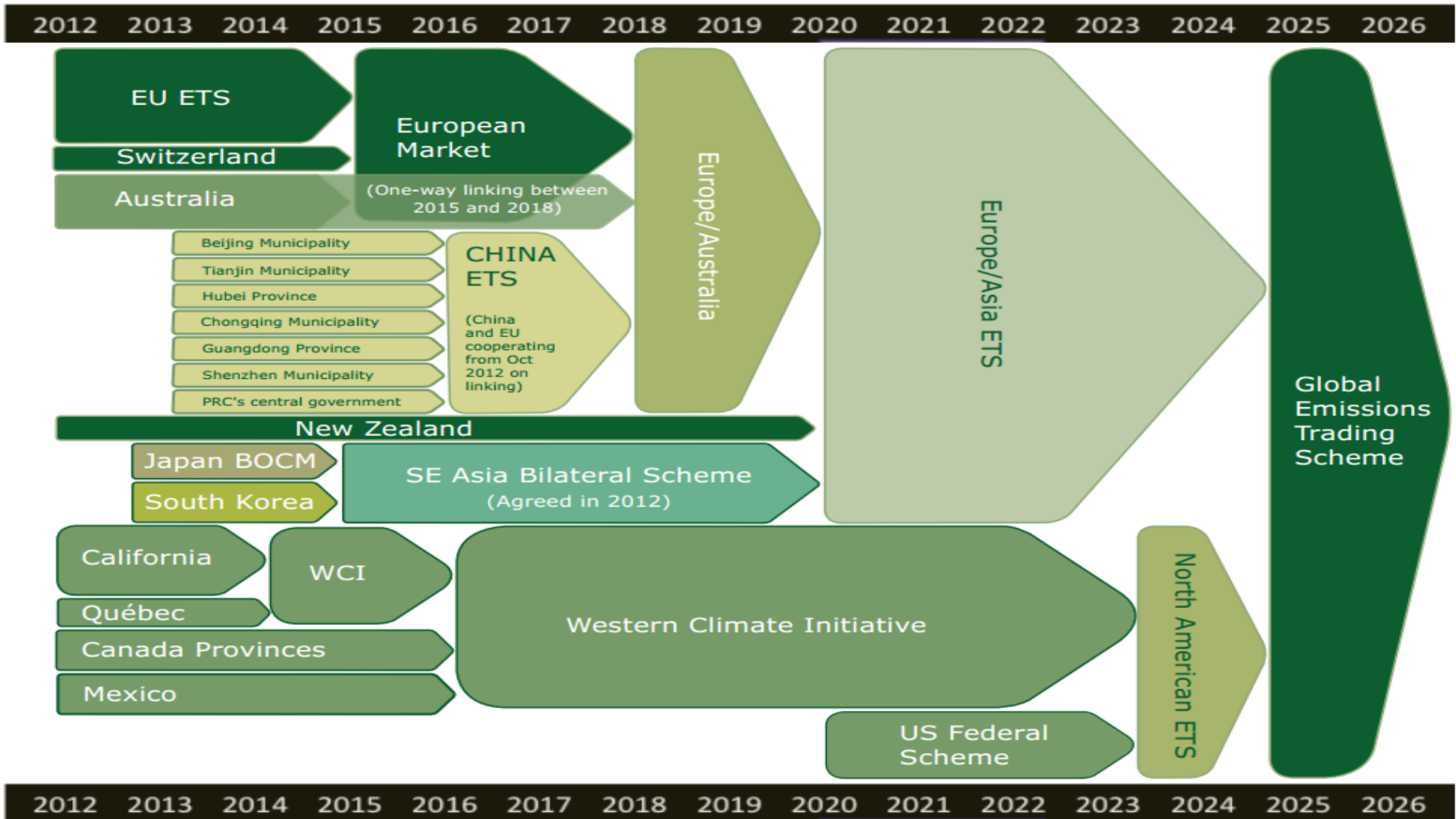
EU ETS price development



Carbon Pricing continues

- UNFCCC
 - Kyoto Protocol & post-2020
- Bilateral agreements
 - e.g. Japan Bilateral Offset Credit Mechanism
- Unilateral action
 - e.g. Chinese cities
- Linking schemes
 - efficiency – harmonisation
 - > a bottom-up international climate effort

Carbon-pricing - 75% global GDP

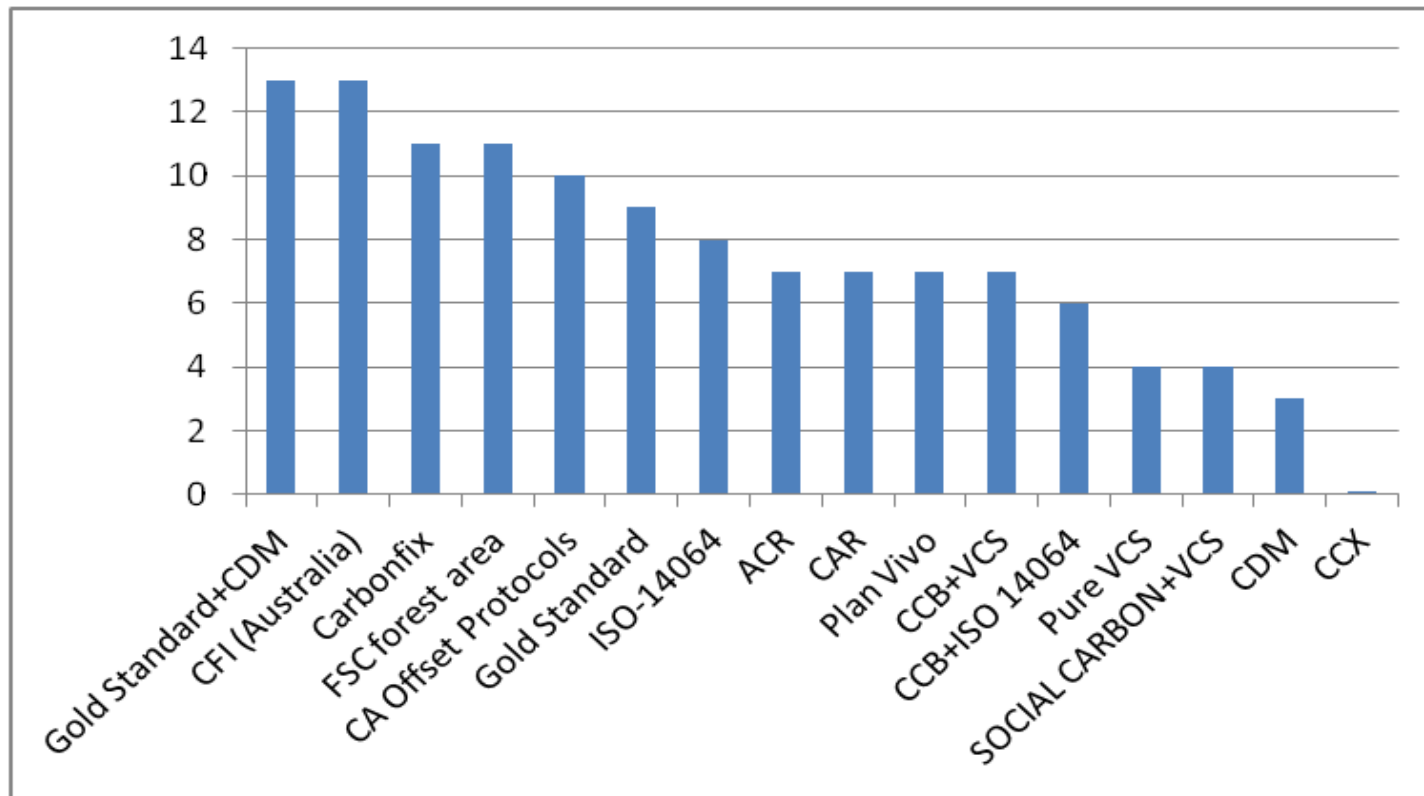


Source: Promethium Carbon, 2013

Short-term carbon funding perspectives

- Compliance markets (e.g. EU ETS)
 - Currently facing oversupply
- Carbon funds (e.g. World Bank BioCarbon Fund)
 - Currently facing oversupply
- Voluntary markets (e.g. VCS)
 - Supply-demand currently balanced
- But, prices differ, depending on:
 - Carbon market scheme (compliance or voluntary)
 - The specific certification standard (Gold Standard)
 - Host country (LDCs)
 - Linking flexibilities (quotas)
 - Project type (eligibility)

Average carbon credit price in 2012 for different voluntary carbon schemes (in USD/tGHG)



Longer term carbon funding perspectives

- NAMAs
- REDD+
- Green Climate Fund
- New Market Mechanism (Durban)
 - Programmatic or sectoral crediting

Developments in GHG accounting with relevance for biochar

- GHG mitigation impact categories of biochar
 - Carbon sequestration - biochar to soil
 - Renewable energy - oil and gas through pyrolysis
 - Waste diversion (CH_4) - less anaerobic decomposition
 - Lower emissions from soil - $\text{N}_2\text{O} + \text{CH}_4$
 - Lower fertilizer production - biochar as 'fertilizer'

- Biochar Carbon Offset methodology
 - Developed and submitted to American Carbon Registry (ACR) for public commenting (until 22 November 2013)

Conclusions

- Carbon markets have become weak
- Funding opportunities continue to exist
- Now is the time to develop biochar GHG accounting methodology/ies for carbon crediting

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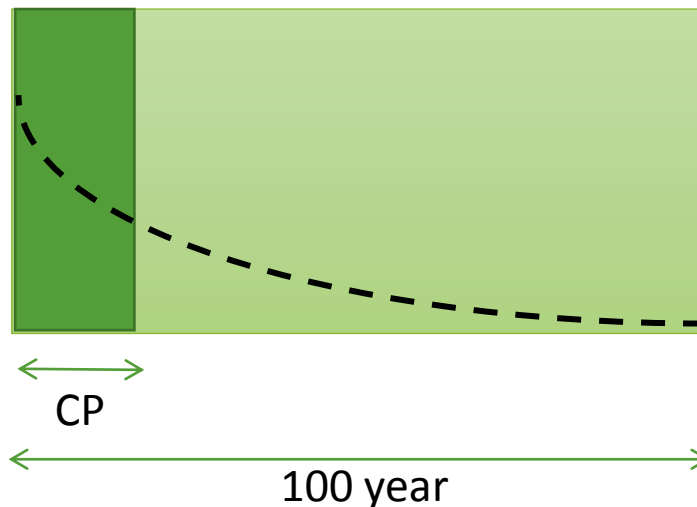
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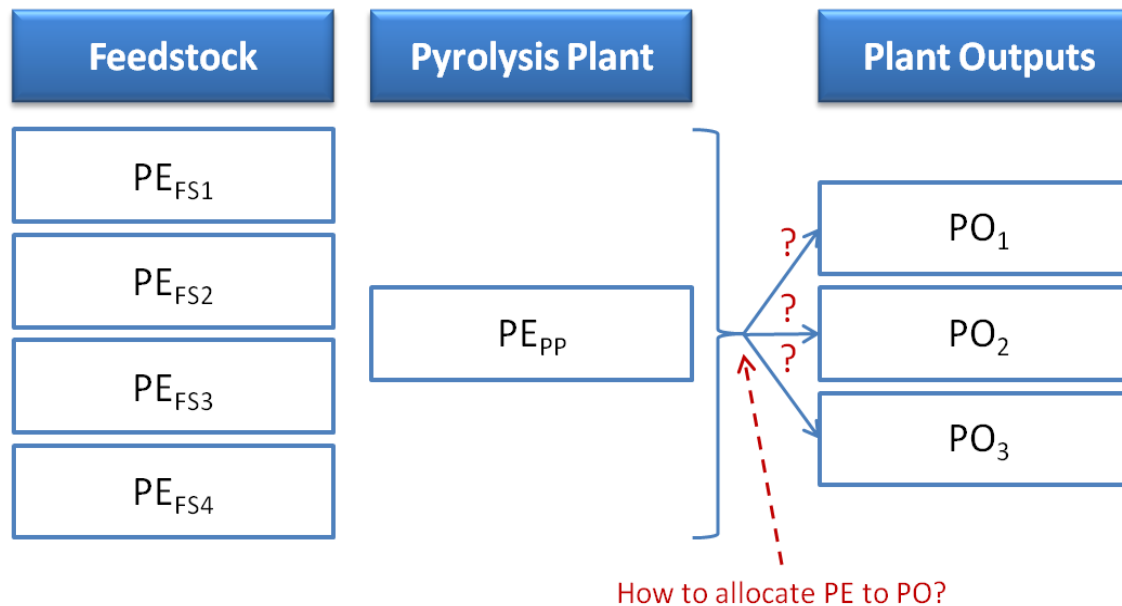
Review of Biochar Carbon Offset Methodology

- Should biochar activities become more mainstream, the scope of the biochar methodology might need to be broadened to also allow for the use of *primary biomass resources* for biochar production.
- Project-related (non-priming) SOC losses (avoided carbon sequestration) *during the crediting period* could be significant in cases where the baseline scenario is uncontrolled aerobic decomposition of the feedstock. This impact even holds given the fact that the SOC stored in the baseline (during crediting period) would also have declined to about 1% of initial SOC in feedstock in a time frame of about 100 years.



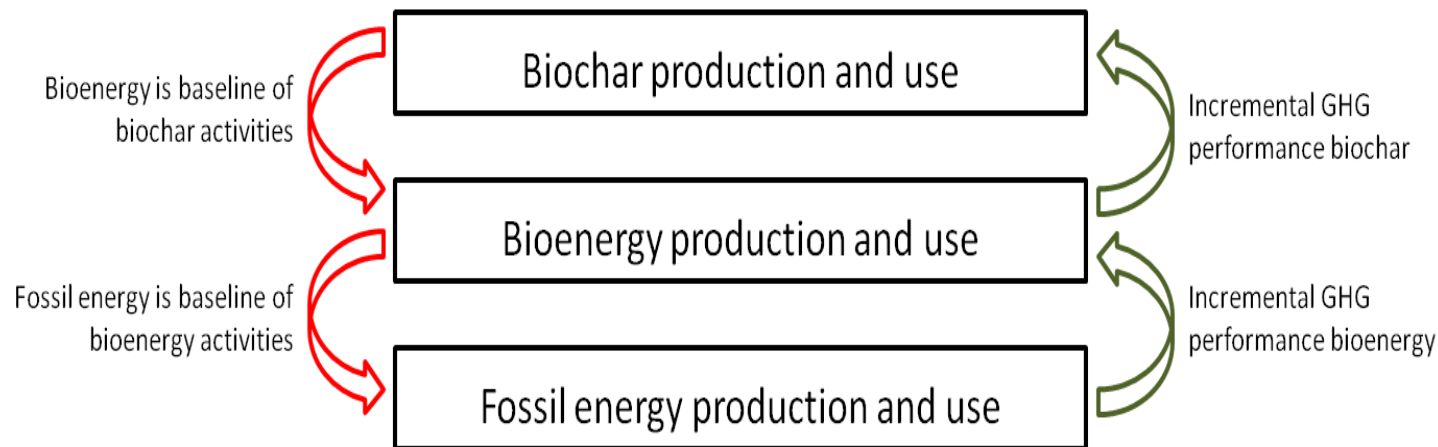
Review of Biochar Carbon Offset Methodology

- Further methodological *guidance on allocation* is needed should project developers desire to be able to properly allocate or apportion project emissions (PE) to specific project outputs (PO), such as biochar and energy.



Review of Biochar Carbon Offset Methodology

- The prevailing practices and notions regarding baseline setting might not always be in line with commonly accepted notions of *biomass cascading* where the ‘better’ or more ‘sustainable’ use of a given biomass resource should prevail. In this regard the carbon market might not always provide the strongest incentive to the ‘best’ use.



- What if:
 - $\text{incremental GHG}_{\text{biochar}} > \text{incremental GHG}_{\text{bioenergy}}$
 - $\text{incremental GHG}_{\text{biochar}} < \text{incremental GHG}_{\text{bioenergy}}$

Review of Biochar Carbon Offset Methodology

- The biochar methodology might also benefit from including methodological guidance on the potential emission reduction claims that can be made as a result of the *avoidance of the use of fossil fertilizers* due to biochar admission to soils.